EXHIBIT 2

Engineering Statement

I. Introduction

This Engineering Statement has been prepared in response to various petitions for reconsideration or clarification of the Commission's Memorandum Opinion and Order ("MO&O") in GEN Docket No. 90-314, FCC 94-144.

II. Association for Maximum Service Television, Inc. ("MSTV")

In addition to other proposals, MSTV proposes that the Commission restrict PCS operations in a 20 MHz guard band below the 1990-2110 MHz broadcast auxiliary band. As discussed below, MSTV's proposal would severely impact the PCS Block C and Block F licenses and is based upon interference analyses that assume unrealistic worst case conditions rather than carefully assessing the reasonable probability of harmful interference.

In the Statement of Dane E. Ericksen, Consulting Engineer ("Ericksen Statement") attached to the MSTV petition, a guard band of "20 MHz at the top of the PCS band" is recommended as "by far the best solution". The MSTV guard band proposal would place restrictions on PCS operations in the 1970-1990 MHz band affecting the Block C (1895-1910 and 1975-1990 MHz) and the Block F (1890-1895 and 1970-1975 MHz) PCS licenses (established as the entrepreneurs' blocks in the Fifth Report & Order, PP Docket N. 93-253, FCC 94-178). MSTV proposes that these blocks be required to operate with base station transmissions in the lower half of their bands and mobile/portable transmissions in the upper half. Since this is exactly opposite to every frequency division duplexed PCS system proposal of which APC is aware, this would place the entrepreneurs' blocks on a technical island with their customers being unable to roam to

other markets on PCS frequency blocks A, B, D and E. Such a restriction would effectively limit the participation of designated entities in the PCS industry and certainly place the Block C and Block F licenses at a competitive disadvantage.

A. The MSTV interference analyses do not assess the realistic potential for interference to broadcast auxiliary operations; instead, severe assumptions are utilized to dramatize any potential concerns.

Both the Ericksen Statement and the letter from Carl Guastaferro to Dane Ericksen (Guastaferro letter) attached to the MSTV Petition contain interference calculations based upon an assumed PCS base station power of 1640 watts pointed directly at an ENG receiver. These calculations also assume that the ENG receivers are within 100 meters, in the first case, and 100 feet in the second case. Extrapolating the free space propagation loss assumption for the immediate proximity case to distances more commonly associated with fourth law propagation losses, these calculations conclude that a 2 km "buffer" around ENG receivers is necessary to protect against "brute force" interference. While such interference cases could theoretically occur, it is extremely misleading to conclude that this buffer is necessary for all, most or even a small percentage of ENG receivers.

In the MO&O, the Commission increased the allowed PCS base station power to 1640 watts EIRP. This increased power unquestionably serves the public interest by reducing the infrastructure costs of bringing PCS service to sparsely populated areas and thus promoting the rapid provision of low-cost PCS services to rural areas. It is incorrect in the extreme, however, to assume that all, or even most, PCS base stations will operate at this power level. First, other FCC rules limit the radiated power of PCS base stations. These limitations include interference protection to OFS incumbents, field strength limits at service-area boundaries and RF exposure restrictions. Second, in congested areas requiring extensive frequency re-use, intra-system interference concerns will limit radiated

powers far below this level. Presumably, it is these congested areas that contain the vast majority of broadcast auxiliary use.

Even for cases involving PCS base stations with 1640 watts EIRP, it is misleading to assume that this power will be radiated in all directions -- especially directly at an existing ENG receiver. The antenna gain necessary for a PCS base station to achieve an EIRP as high as 1640 watts requires a highly directional antenna, probably an adaptive "smart" antenna, which concentrates power in a very narrow beamwidth. In the sparsely populated areas where a PCS base station might utilize 1640 watts EIRP, it is not likely that ENG operations would even be used, let alone used with 100 meters. In this unlikely case, it is further unlikely that the PCS radiation would be pointed directly at the ENG receiver. Furthermore, the PCS radiation would have to be pointed at the ENG receiver while the ENG receiver was actually in use receiving a transmission from some newsworthy event. Finally, a steerable ENG receive antenna would, at the same time, have to be pointing directly at the PCS antenna (in other words, the PCS antenna would have to be directly between the ENG receiver and the newsworthy event).

The interference calculations are also misleading in that free space propagation characteristics are assumed out to distances as great as 2 km. Such an assumption requires the belief that line-of-sight conditions would exist for every possible PCS base station location within 2 km of an ENG receiver. This line-of-sight condition would have to exist in addition to the requirements that the PCS base station utilize 1640 watts EIRP even in congested areas and that the radiation be pointed directly at the ENG receiver while that receiver was in operation and pointed directly back at the PCS antenna.

The MSTV interference calculations are not reasonable predictions of the likelihood of interference to ENG operations. Furthermore, the MSTV petition does not consider that alternative frequency bands are currently available for ENG and other broadcast auxiliary use including: 2450-2483.5 MHz, 6875-7125 MHz and 12.7 - 13.25 GHz.

B. The issues raised by MSTV have already been considered by the Commission.

MSTV claims on pages 2-3 that:

"In revising the base station emissions limit, the Commission did not take account of the potential for interference to broadcast auxiliary users in the upper adjacent band (1990-2110 MHz)..."

Contrary to this statement, the Commission did indeed consider potential interference to broadcast auxiliary from PCS base stations with the increased allowed power limit. In paragraph 191 of the MO&O, the Commission states:

"With regard to Blooston's request that we require PCS licensees to protect common carrier microwave operations in the adjacent 1990-2110 MHz band, we note that the current PCS rules provide for strict out-of-band emissions limits. We believe that these limits are sufficient to protect microwave operations in adjacent bands and, therefore, will not adopt any additional coordination or protection requirements for PCS operations." (footnote omitted)

As the Commission correctly found, additional measures, such as those proposed by MSTV, are not necessary to provide out-of-band interference protection.

III. Celsat, Inc. ("Celsat")

Celsat requests that the Commission allocate the 1970-1990 MHz band to the Mobile Satellite Service (MSS) on a secondary basis. This proposal would add uncertainty to the quality of PCS systems operating in the frequency bands established as entrepreneurs blocks and place unique restrictions upon the use of the these bands.

Celsat claims that it can coexist with both OFS microwave incumbents and PCS licensees without interference. In light of the fact that hundreds of millions of dollars are at stake in the auctioning of Block C and Block F PCS licenses and relocating OFS incumbents, Celsat faces a far greater burden of proof. Since access to financing is known to be a critical issue facing designated entities, the additional uncertainty of potential

interference from satellite operations adds one more straw on the camel's back. The Celsat request would place the entire fabric of the FCC rules promoting participation of designated entities in PCS at risk without concrete demonstration of the viability of its spectrum sharing proposal.

Furthermore, Celsat's spectrum sharing proposal places unique restrictions on the entrepreneurs' blocks. It appears from the discussion on pages 5 and 6 that, in order to avoid interference, designated entities would be required to operate with base station transmissions in the lower half of their bands and mobile/portable transmissions in the upper half. As discussed in Section II, above, this is reverses the industry accepted approach of utilizing the lower band (with slightly lower propagation losses) for the mobile/portable transmissions and would make the designated entities' systems incompatible with the rest of the PCS industry. This requirement would effectively limit the participation of designated entities in the PCS industry.

The Commission has already committed to initiating a proceeding in the near future to allocate additional frequencies for MSS. In light of this commitment, there is no need to add uncertainty, inherent in the Celsat proposal, to the entrepreneurs' blocks.

IV. ArrayComm, Inc. ("ArrayComm") and Spatial Communications, Inc. ("SCI")

While we applaud the detailed work done by these companies to craft power limitations incorporating concepts of peak power and average power, the existing FCC rule allowing 1640 watt EIRP for PCS base stations with a 100 watt limit on transmitter power output, achieves full flexibility for PCS licensees. Since the current FCC rules allow the SDMA technology promoted by these companies, it is unclear why further reconsideration is necessary. The characterization that the current FCC rule discourages the use of smart antenna technology is not relevant; it is sufficient that the rule allows the technology. Furthermore, there is no ambiguity concerning the 100 watt transmitter power limit that requires clarification. The peak output power cannot exceed 100 watts, there is no reference to the RF channel to which the transmitter is tuned nor does the rule require

such a reference. In addition, the ArrayComm and SCI proposal involves 14 new definitions and at least two new formulas. Absent the identification of a promising PCS technology precluded from use by the existing rules, the existing rule should be maintained.

CERTIFICATE OF SERVICE

I, Anne V. Phillips, certify that on this 30th day of August, 1994, I caused to be mailed by first class United States mail, postage prepaid, a copy of the foregoing "Comments of American Personal Communications on Petitions for Reconsideration" to the following:

Michael F. Altschul
Vice President, General Counsel
Cellular Telecommunications
Industry Association
1250 Connecticut Avenue, N.W., Suite 200
Washington, D.C. 20036

Comcast Corporation
c/o Leonard J. Kennedy
Richard S. Denning
Dow, Lohnes & Albertson
1255 23rd Street, N.W.
Washington, D.C. 20037

Julian L. Shepard
Vice President and General Counsel
Victor Tawil
Vice President
Association for Maximum Service
Television, Inc.
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Celsat, Inc.
c/o Victor J. Toth
Law Offices, Victor J. Toth, P.C.
2719 Soapstone Drive
Reston, Virginia 22091

Spatial Communications, Inc.
ArrayComm, Inc.
c/o Jill Abeshouse Stern
Shaw, Pittman, Potts & Trowbridge
2300 N Street, N.W.
Washington, D.C. 20037